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## (54) Absorbent sheet

(57) An absorbent sheet (1) comprises a first sheet element (3) of a material impermeable to liquids in at least one direction and a second sheet element (2) having at least an area (9) which is permeable to liquids in at least one direction, the two sheet elements (2, 3) lying one on top of the other and being attached together in such a way as to provide a pocket, at least in the permeable area, into which an absorbent material can (14) be inserted, the first sheet element (2) preventing liquids from passing out of the absorbent sheet (1) and the second sheet element (3) permitting the passage of liquids into the absorbent sheet (1) in its permeable area (9).

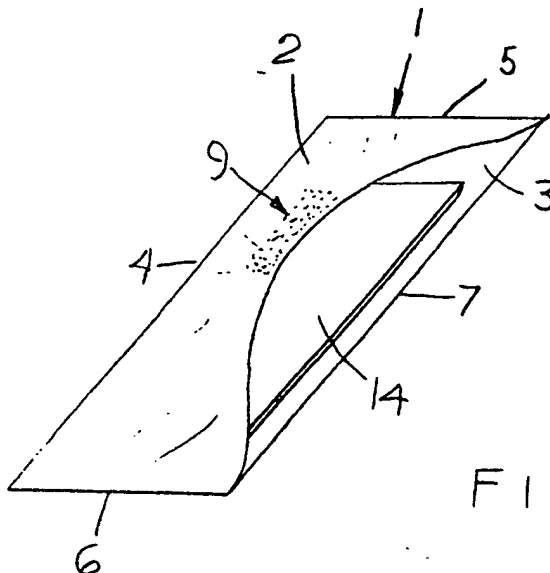


FIG. 2.

GB 2 189 993 A

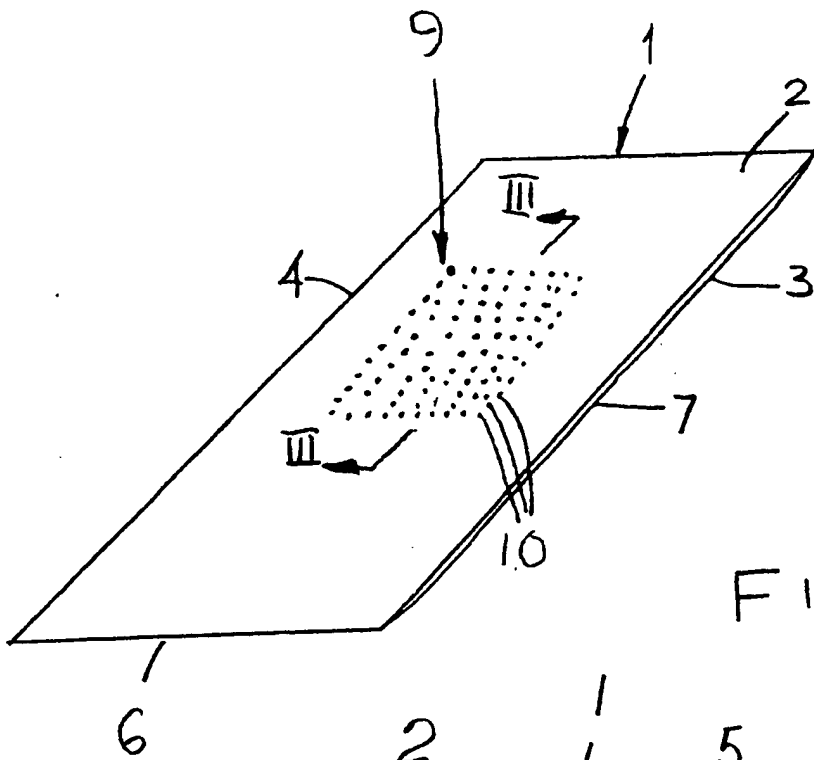


FIG. 1.

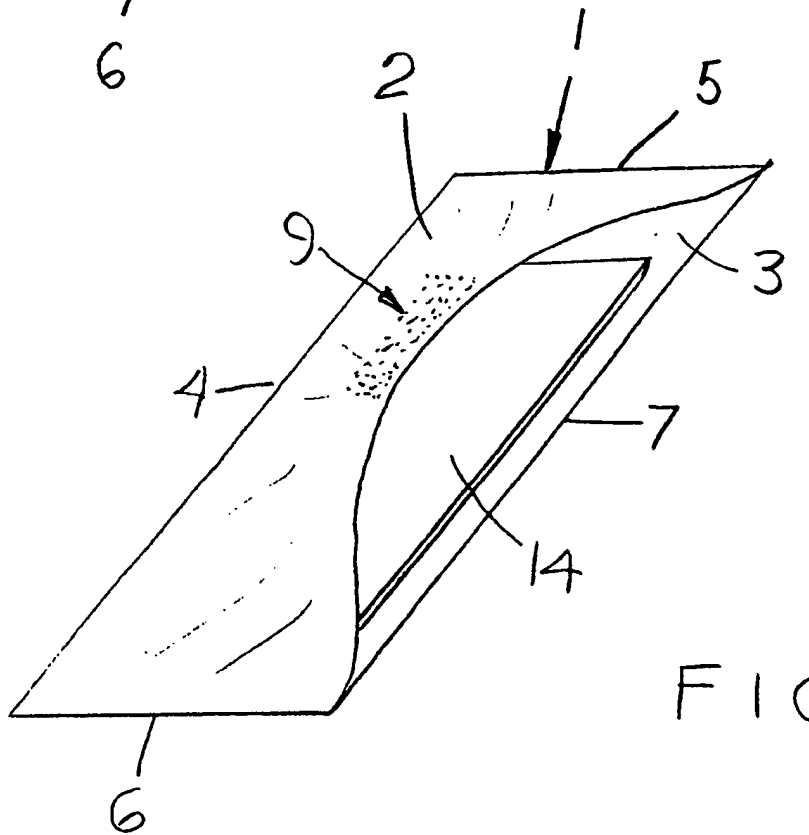


FIG. 2.

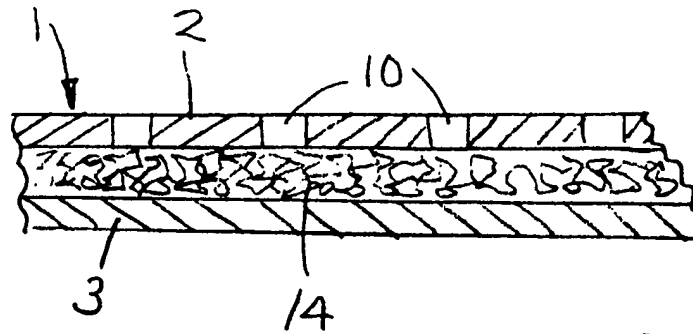


FIG. 3.

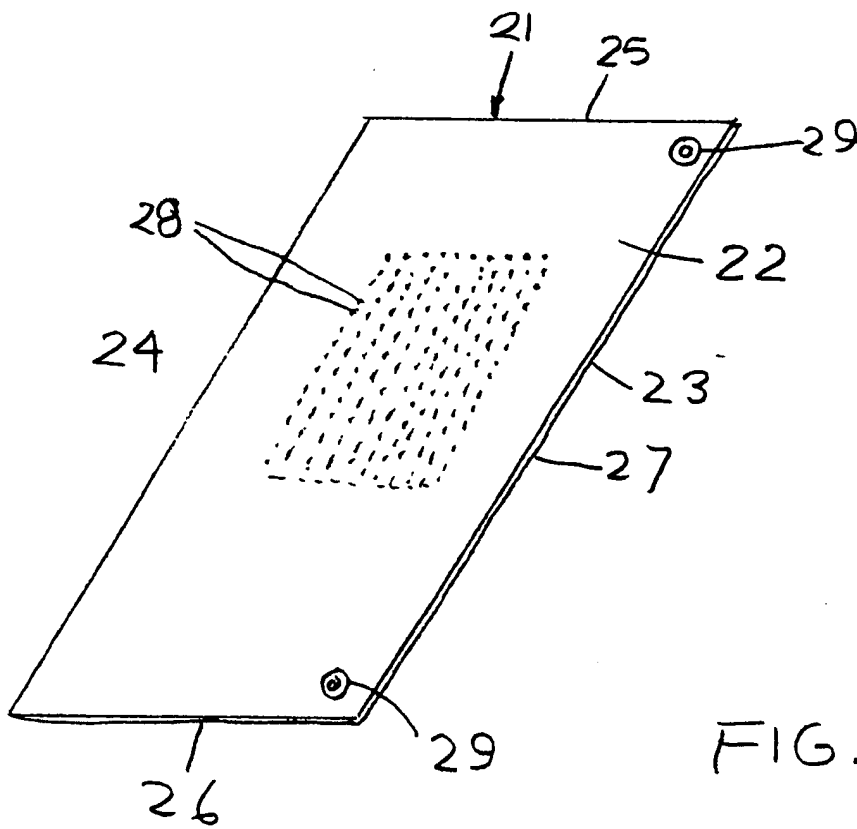


FIG. 4.

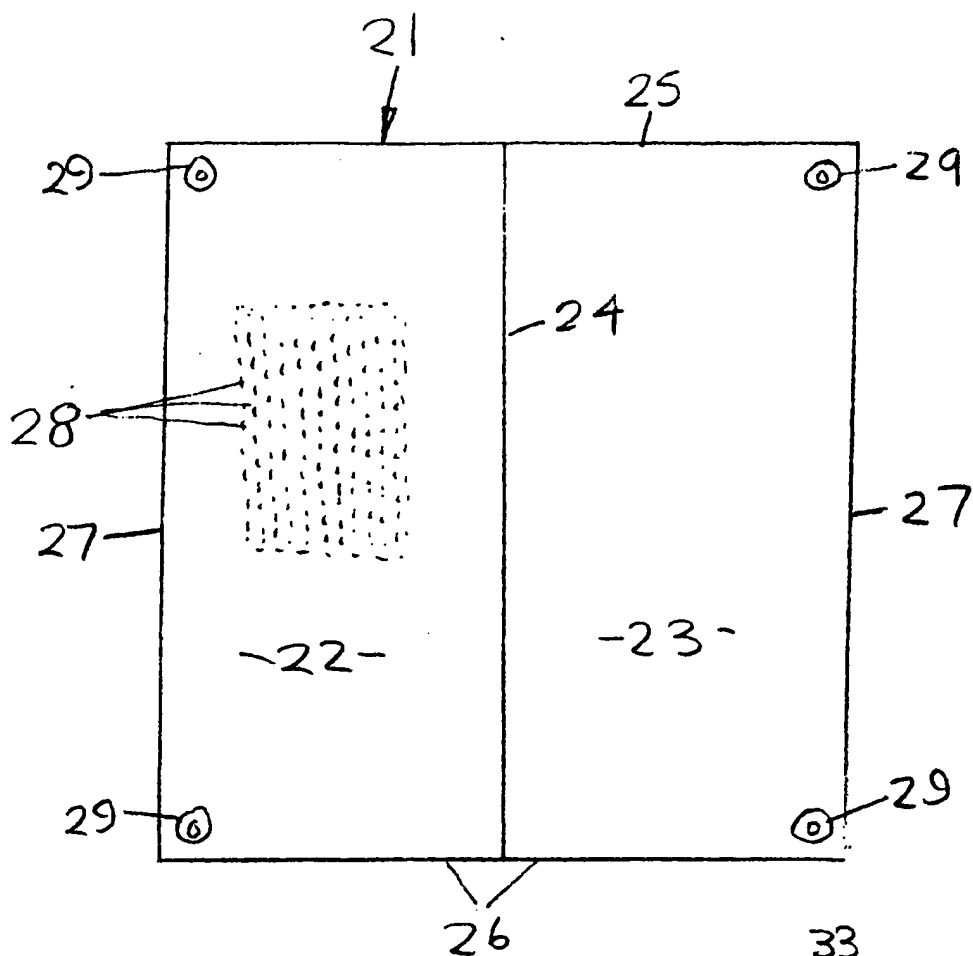


FIG. 5.

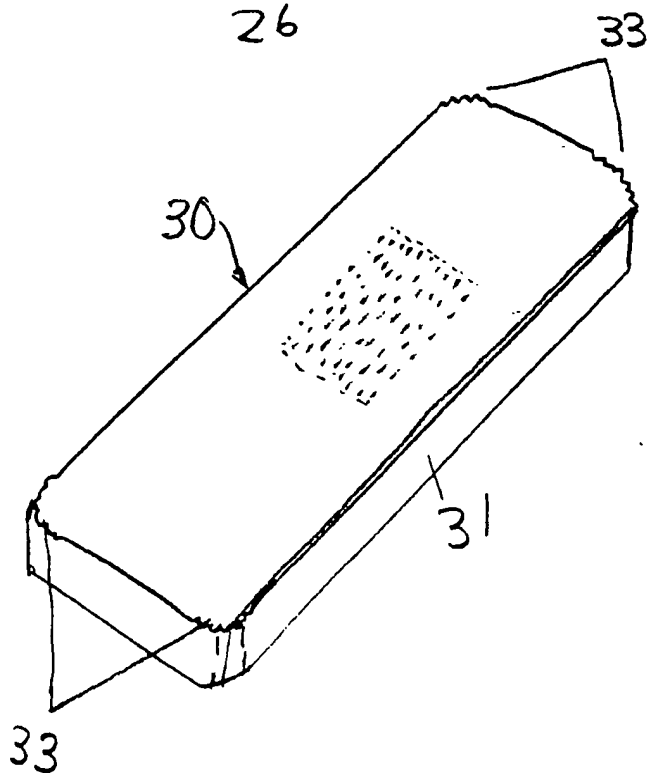
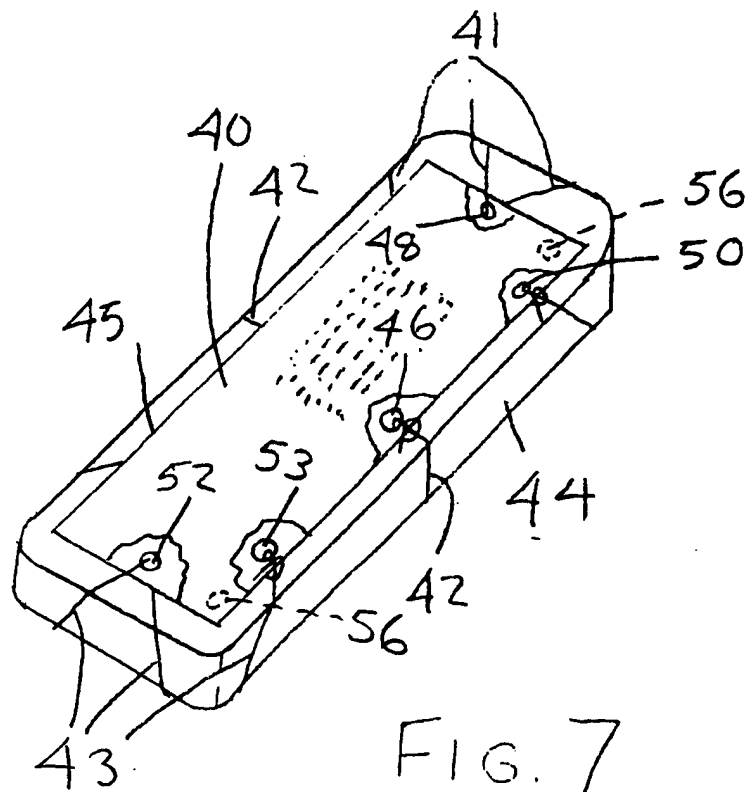


FIG. 6



## SPECIFICATION

### Absorbent Sheet

This invention relates to absorbent sheets.

5 Many problems exist with children who sometimes wet their beds and with the elderly who are sometimes incontinent. It is often very unsatisfactory to force children who are getting older to wear rubber pants and napkins. This is  
10 unpleasant for them and additionally has a psychological effect in making them feel different and inadequate.

One cannot, however allow them to soil their beds since, not only does this create the problem of  
15 excessive laundry but also the problem of saturated mattresses. Mattresses cannot usually be laundered and therefore their continued use with constant soiling renders them extremely unhygienic and fosters disease. Thus it would be necessary to  
20 replace such mattresses at frequent intervals at considerable expense.

One method used in an attempt to alleviate this problem is to place a rubber or other liquid impermeable sheet on the bed, usually adjacent to  
25 the mattress or at least beneath the underneath sheet. While this measure helps to some extent, it is not by any means the complete answer. Because the sheet is impermeable, in order to keep the underlying mattress dry, any wetting will collect at  
30 the lowest part of the sheet and stay there forming a pool in which the sufferer must lie. Equally, there is a tendency for the liquid to run off the edges when there is any movement or when the user gets out of bed. In these latter circumstances, the purpose of  
35 the sheet is negated and soiling of the mattress and other bed coverings result, albeit in a more widely spaced area.

The present invention seeks to provide an absorbent sheet which will substantially reduce or  
40 obviate some or all of these problems.

According to the invention, there is provided an absorbent sheet comprising a first sheet element of a material impermeable to liquids in at least one  
45 direction and a second sheet element having at least an area which is permeable to liquids in at least one direction, the two sheet elements lying one on top of the other and being attached together in such a way as to provide a pocket, at least in the permeable  
50 area, into which an absorbent material can be inserted, the first sheet element preventing liquids from passing out of the absorbent sheet and the second sheet element permitting the passage of liquids into the absorbent sheet in its permeable  
55 area.

Further according to the invention, there is provided an absorbent sheet comprising a first sheet element of a material impermeable to liquids and a second sheet element having at least an area  
60 which is permeable to liquids, the two sheet elements lying one on top of the other and being attached together in such a way as to provide a pocket, at least in the permeable area, into which an absorbent material can be inserted.

Preferably, the pocket extends over substantially  
65 the whole surface area of the sheet. The two sheet

elements may be welded or otherwise secured together over three of their sides, leaving the fourth side open for access to the interior. Alternatively, the sheet elements may be connected together only  
70 along one edge so that the two sheet elements can be folded together. In this latter circumstance, releasable fasteners are preferably provided, at least at the remaining corners, to retain the sheet elements in the folded state.

75 The sheet elements may be made of the same material, the permeable area of the second sheet element being formed by the provision of perforations. In this case the sheet may be formed by a single sheet member which is folded in half.

80 The invention will now be described in greater detail, by way of example, with reference to the drawings in which:—

Figure 1 is a view of one form of absorbent sheet in accordance with the invention from above;

85 Figure 2 is a perspective view of the sheet shown in Figure 1 showing how it can be opened for access to the interior;

Figure 3 is a sectional view of a portion of the sheet taken on the line III—III of Figure 1;

90 Figure 4 is a view similar to Figure 1, showing a second form of sheet in accordance with the invention;

Figure 5 is a plan view of the sheet of Figure 5 in an unfolded state;

95 Figure 6 is a perspective view of a form of sheet in accordance with the invention which can be fitted around a mattress like a so called "fitted sheet", and

Figure 7 is a perspective view of a form of sheet in accordance with the invention in which the sheet is fitted with ties for locating it in position on a  
100 mattress.

Referring firstly to Figures 1 to 3, there is shown an absorbent sheet 1 comprising two sheets 2 and 3 of basically impermeable material, such as rubber, connected together, suitably by welding, around three sides 4, 5 and 6 leaving the fourth side 7  
105 unsealed. If desired, the two sheets 2 and 3 may be made from a single sheet of twice the size of the individual sheets 2 and 3 folded in half, thus only requiring welding along the two sides 4 and 6. As can be seen particularly in Figure 1, the upper sheet is rendered permeable to liquid over a central area 9 by perforations 10 which allow liquid to pass relatively freely into the interior of the sheet.

115 The sheet has the form of a large pocket, in the interior of which is located a further sheet 14, this time of absorbent material. This may take the form of absorbent paper or absorbent cloth such as terry towelling or the like. This sheet 14 is removable from the interior of the sheet 1 and in the first case can be disposed of or in the second case, washed for reuse.

As Figure 2 shows, the flexibility of the material of the sheets 2 and 3 is such that they are readily  
125 parted for access to the interior.

Figures 4 and 5 show a form of sheet in which even greater access can be had to the interior of the sheet. In this case, the sheet 21 is formed of a single large sheet of liquid impermeable material which is folded over to form upper and lower parts 22 and 23.  
130

Thus, while there is one permanently sealed side 24, the other three sides 25, 26 and 27 are open. So that the sheet will remain closed in use, it may be provided with snap closures 29 of the type generally known as "poppers". These may be provided only at the corners as shown or may be provided in lines along the sides, as is usual, for example when closing the openings of duvet covers.

It will be appreciated that with this latter form of sheet the sheet can be totally undone and unfolded so that the insertion of the absorbent sheet is relatively easy and the sheet has no inaccessible corners.

Figure 6 shows a sheet 30, of either of the above types which is provided with an edging portion 31 by means of which it can be located on and around a mattress. To this end, the parts 32 of the edging portion intended to pass over the ends of the mattress may be suitably elasticated as is usual with fitted sheets. However, where the material of the sheet is rubber, the resilience of the rubber may be sufficient without further elastication.

Figure 7 shows a sheet 40 of the type shown in Figure 5 which is provided with ties 41 to 43 by means of which it can be attached to a mattress 44. In order to make the construction clearer, the top sheet has been cut away at various points. All the ties 41 to 43 are attached to the side of the sheet 45 at which it is folded in half, one tie 42 being attached in the middle and the other ties 41 and 43 being attached towards the corners.

The middle tie 42 passes straight underneath the mattress and is tied to an eyelet 46 in the other side of the sheet 40. The end tie 41 passes diagonally under the mattress 44, through an eyelet 48, back diagonally under the mattress 44 and is finally tied to an eyelet 50. Likewise, the end tie 43 passes diagonally under the mattress 44, through an eyelet 52, back diagonally under the mattress 44 and is finally tied to an eyelet 53. In this way the sheet 40 is firmly located on the mattress 44 but is readily removable when required.

It will be appreciated that all the tie fastenings are associated with the under fold of the sheet, the sheet being provided with snap fastenings 56 which enable the sheet 40 to be opened and the absorbent sheet (not shown) removed and replaced without the need to detach the sheet 40 from the mattress 44.

In the case of the use of a sheet of the type shown in Figures 1 to 3, the eyelets would normally be provided through both parts of the sheet, the absorbent sheet being of a suitable size to accommodate them.

With material which has of a rubber or like finish, it is desirable to place the sheet beneath a normal sheet so that the occupant of the bed is not uncomfortable. If, however, a material having a suitable fabric finish is used, the occupant can lie directly on the absorbent sheet, thus providing a further saving in laundry. One such material which would be suitable for this purpose is that sold under the registered trade mark GORE-TEX.

It will be understood that sheets having unidirectional permeability may be used, the sheets

being arranged such that the sheets are only permeable inwards, i.e. into the absorbent material. One or both sheets making up the absorbent sheet may be of this unidirectional permeability.

It will be appreciated that various modifications may be made to the above described embodiments without departing from the scope of the invention. For example, in the first embodiment, closures such as snap fasteners may be provided to close the open side. Other types of closures may be used in any of the embodiments. For example sliding clasp fasteners could be used or the sheet may be provided with string or ribbon ties.

Although the embodiments have been shown with the top sheet element permeable over only a part thereof, it is possible for the entire upper sheet to be permeable. The absorbent sheet provided between the two sheet elements may be of a size to cover only the relevant permeable area or may take up the full size of the pocket. In the former case, the under sheet element may be provided with corner locators, e.g. similar to photo corners.

It is not essential that the pocket extends for the entire dimensions of the sheet, a reduced size pocket may be provided.

From the above it will be seen that the described embodiments provide an absorbent sheet which can significantly ease problems encountered with bed wetting and the like.

## CLAIMS

1. An absorbent sheet comprising a first sheet element of a material impermeable to liquids in at least one direction and a second sheet element having at least an area which is permeable to liquids in at least one direction, the two sheet elements lying one on top of the other and being attached together in such a way as to provide a pocket, at least in the permeable area, into which an absorbent material can be inserted, the first sheet element preventing liquids from passing out of the absorbent sheet and the second sheet element permitting the passage of liquids into the absorbent sheet in its permeable area.

2. An absorbent sheet comprising a first sheet element of a material impermeable to liquids and a second sheet element having at least an area which is permeable to liquids, the two sheet elements lying one on top of the other and being attached together in such a way as to provide a pocket, at least in the permeable area, into which an absorbent material can be inserted.

3. A sheet as claimed in claim 1 or 2, wherein the pocket extends over substantially the whole surface area of the sheet.

4. A sheet as claimed in claim 1, 2 or 3, wherein the two sheet elements are secured together over three of their sides, leaving the fourth side open for access to the interior.

5. A sheet as claimed in claim 4, wherein the sheets are welded together.

6. A sheet as claimed in claim 1 or 2, wherein the sheet elements are connected together only along one edge so that the two sheet elements can be folded together.

7. A sheet as claimed in claim 6, wherein releasable fasteners are provided, at least at the remaining corners, to retain the sheet elements in the folded state.
- 5 8. A sheet as claimed in any one of claims 2 to 7, wherein the sheet elements are made of the same material, the permeable area of the second sheet element being formed by the provision of perforations.
- 10 9. A sheet as claimed in any one of claims 2 to 7, wherein the sheet elements are both made of a unidirectional liquid permeable material.
- 15 10. A sheet as claimed in claim 8 or 9, wherein the sheet is formed by a single sheet member which is folded in half.
11. A sheet as claimed in any one of claims 1 to 10, wherein the sheet is provided with a skirt portion with elasticated corners so that it forms a fitted sheet fitted to the bed.
- 20 12. A sheet as claimed in any one of claims 1 to 10, wherein the sheet is provided with tie members for securing it to a bed.
- 25 13. A sheet as claimed in claim 12, wherein the tie members are permanently attached to one side of the sheet and eyelets are provided at the opposite side of the sheet for attachment of the free ends of the tie members.
14. An absorbent sheet substantially as described herein with reference to the drawings.